



AMERICAN JOURNAL OF PHARMTECH RESEARCH

Journal home page: <http://www.ajptr.com/>

Formulation and Evaluation of *Tridax Procumbens* Herbal suspension

Minesh N. Chawhan*

Professor and HOD, Matoshri Asarabai Darade Ayurved College, Babulgaon, Yeola, Nashik, India

ABSTRACT

A study of ancient literature indicates that diabetes was fairly well known and well conceived as an entity in India. Plant-based drugs have been used against various diseases since a long time. The nature has provided abundant plant wealth for all the living creatures, which possess medicinal virtues. The essential values of some plants have long been published, but a large number of them have remained unexplored to date. Therefore, there is a necessity to explore their uses and to conduct Pharmacognostic and pharmacological studies to ascertain their therapeutic properties. In fact, nowadays, diabetes is a global problem. *Tridax procumbens*, is a weed extensively used in traditional medicine as anticoagulant, antifungal and insect repellent. Water extract of leaf and flower contained more proteins when compared to its methanolic counterpart. The same was observed in case of total free phenol present wherein among the methanolic extracts, leaf showed good result when compared to flower. Hydroxyl free radical scavenging assay is an assay to determine the antioxidant property of the sample.

Keywords: Anticoagulant, Antifungal, Diabetes, Insect repellent, Methanolic extract.

*Corresponding Author Email: mukeshshukla6122@gmail.com

Received 08 September 2023, Accepted 15 October 2023

INTRODUCTION

Formulation and stability studies of herbal suspension of *tridax procumbeans*, Article has been designed for two types of method in which one of the methods is Suitable for type-II Diabetic patient. The First Formulation is in the Extraction process and the Second one is in the form of powder. The Important role of the Herbal drug in the development of significant therapeutic agent. The main objective of development of herbal formulation is to provide the pharmacological agent and therapeutic agent, within this procedure has been readily way to maximum therapeutic efficacy with minimum side effect ¹. Therefore, the Nan emulsification and Nino technology with new technology method used for Herbal formulation product. Ayurvedic medicine which is accessible and does not require laborious pharmaceutical synthesis because it seems highly attractive. Although oral hypoglycemic agents and insulin are the main stay of treatment of diabetes and are effective in controlling hyperglycemia. This herbal formulation method mainly affects bioavailability ². They also possess various pharmacological activities, this plant extract is used to treated in diabetes, this plant found throughout in India especially in Maharashtra. Madhya Pradesh and Chhattisgarh regions Linn. belong to the Asteraceae family, is an ayurveda herb of Asia this plant found throughout in India especially in Maharashtra, Madhya Pradesh and Chhattisgarh regions. It is a medicinal plant. *Tridax procumbens* is common names is 'Ghamra' in Hindi, coat button, in English and scientific name is *Tridax procumbens*. *Tridax* is herbal of about 10-30 cm in length with levees about 4 – 5 cm, The stem is height of 20-60 cm. *tridax procumbeans* have yellow with hairs. They are about 0.4-0.6 inch (1.-1.5 cm) wide, and held on a 4-12 inches (10-30 cm) long stalk with hair ^{3,4}.

Diabetes mellitus

WHO According, diabetes mellitus are disease, that is not transmissible directly from one person to another, and estimated 77 million people are suffering to diabetes mellitus. India rank second most affected in the world as well as number one rank of the China. Diabetes mellitus is a metabolic disorder in the endocrine system and these are chronic disorder in metabolism of carbohydrate, proteins, and fat. Diabetes is a condition in which there increase the glucose level in the blood. Over time glucose level increase in blood can damage the body organ. The effects of diabetes mellitus include long-term damage, dysfunction and macro vascular, nerve damage (Neuropathy) and micro vascular blood vessels, which can be failure of various organs including kidney, nerves, stock, heart attack and gastrointestinal tract. Last few years. The higher number of patient age group of between 14 to 25 are increases patient with type-II diabetes and diabetes have increased risk of heart attack and stock in adult. The Diabetes classified into main categories; type-

I diabetes means insulin dependent diabetes mellitus, and type-II diabetes non-insulin dependent diabetes mellitus, type-III Gestation Diabetes is response to the hormonal changes that happen during pregnancy^{5,6}.

Tridax procumbens is a very secondary metabolites such as Alkaloid, Steroid, Carotenoid, Flavonoid, Fatty acid, and Tannins this plant have a variety of medicinal uses including Antioxidant, Anticoagulant, Anti diabetes, Antifungal, wound healing, insect repellent, diarrhea, anthelmintic cardiovascular, Antimicrobial, hepato-protective properties, malaria, high blood pressure, and anti-inflammatory And Further studies reveal the presence of various photochemical screening showing, and this traditional plant from readily available medicine plant have great potential for the discovery of new Anti-Diabetic drug. The Ant diabetic activity are alcohol and water extract of *Tridax procumbens linn*, Leaves Having ant diabetic activity which significantly decadenes in the blood glucoses level. *Tridax procumbeans* plants provides drug to development of suspension therapeutic agent. The herbs used in suspension were whole plant of *tridax procumbeans*.⁷.

Characteristics

Tridax procumbens is a perennial herb that has a creeping stem which can reach from to 10-30 cm in length and 1.-1.5 cm with leaves are opposite, simple and petiolated, the lamina is oblong to lanceolate. The margin is entire; both surfaces are hispid, leaves about 4 – 5 cm. The stem is cylindrical, solid and very hispid is height of 20-60 cm, covered with multicellular hairs. *Tridax procumbens* flowers have creamy white rays and yellow disk florets. They are about 1-1.5 cm wide, and held on a 10-30 cm long stalk. Flowering occurs in spring. Fruits are conical achenes that are dark brown to black in color, and 1.6-3 mm long, each with a head of pappus bristles that vary from 3-6 mm long, and This plant are plumose bristles, alternately long and short, and horizontally spreading at maturity.^{8,9}.

Ecological threat

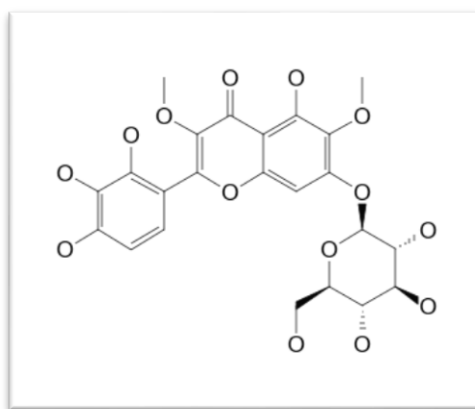
Tridax procumbens It occurs in prefers coarse-textured villages and soils in more tropical locations, along garden, River. roadside, waste land, fallow land, crop and other disturbed area. it is native to South America and Mexico but has naturalized in India (Maharashtra: Common throughout Karnataka: Coors, Dharwar, Hassan, Mysore, N. Kanara, Shimoga Kerala: All districts Tamil Nadu: All districts), Australia. Eastern Himalaya, Africa.¹⁰.

Chemical Constituents

Flavonoids Plant, commonly used in Indian traditional medicine as anticoagulant, hair tonic, antifungal and insect repellent, in bronchial catarrh, diarrhea, dysentery, and wound healing. T.

procumbens present in alkaloids, carotenoids, flavonoids (catechins and flavones), saponins and tannins. This plant is rich in minerals such as iron, copper, manganese, sodium and zinc and other trace minerals such as magnesium, phosphorous, potassium, selenium and calcium. Previously isolated constituents Alkyl esters, sterols, pentacyclic triterpenes, fatty acids and polysaccharides. The aqueous extract contains photochemical such as alkaloids, steroids, carotenoids, flavonoids (catechins and flavones), saponins and tannins. Leaf of T. procumbens mainly contains crude proteins 26%, crude fiber 17% soluble carbohydrates 39% calcium oxide 5%, Luteolin, glucoluteolin, quercetin and isoquercetin. Whereas the oleanolic acid, fumeric acid, fl-sit sterol and tannin is present in good amounts. ¹¹.

Tridax procumbens, has been characterized as -



3,6-dimethoxy-5,7,2',3',4'-pentahydroxyflavone 7-O-β-D-gluco- pyranoside

<u>Mol Weight</u>	<u>Molecular Formula</u>
524.43 g/mol	C ₂₃ H ₂₄ O ₁₄

Table 1: Chemical Tests of *Tridax Procumbens* 11

Chemical Constituents	Identification Test	Uses
Flavonoids	1 g of the powdered dried leaves of each specimen was boiled with 10 ml of distilled water for 5 minutes and filtered while hot. Few drops of 20 % sodium hydroxide solution were added to 1 ml of the cooled filtrate. A change to yellow color which on addition of acid changed to colorless solution depicted the presence of flavonoids.	Anticancer, antioxidant, anti-inflammatory, and antiviral properties. Flavonoids improve the pathogenesis of diabetes and its complications through the regulation of glucose metabolism, hepatic enzymes activities, and a lipid
carotenoids	1g of each specimen sample was extracted with 10 ml of chloroform in a test tube with vigorous shaking. The resulting mixture was filtered and 85 % sulphuric acid was added. A blue color at the interface showed the presence of carotenoids.	β -carotene acts as a protector against various diseases, such as type 2 diabetes mellitus decreasing the risk of disease, particularly certain cancers and eye disease.
Alkaloid	1 g of powdered sample of each specimen was separately boiled with water and 10 ml hydrochloric acid on a water bath and filtered. The pH of the filtrate was adjusted with ammonia to about 6-7. A very small quantity of the following reagents was added separately to about 0.5 ml of the filtrate in a different test tube and observed. Picric acid solution., 10% tannic solution., Mayer's reagent (Potassium mercuric iodide solution). The test tubes were observed for colored precipitates or turbidity.	Anesthetics, cardio protective and anti-inflammatory agents. Alkaloids could be used as preventive and curative agents in the case of endocrine disorders, particularly diabetes and could play a promoting function for the discovery of new ant diabetic agents.
Tannins	1 g of each powdered sample was separately boiled with 20 ml distilled water for five minutes in a water bath and was filtered while hot. 1 ml of cool filtrate was distilled to 5 ml with distilled water and a few drops (2-3) of 10 % ferric chloride were observed for any formation of precipitates and any color change. A bluish-black or brownish-green precipitate indicated the presence of tannins.	anticancer, virucides, antioxidant, antimicrobial and anti-inflammatory Tannins can improve the pathological oxidative state of a diabetic situation
spooning	1 g of each powdered dried stain was separately boiled with 10ml of distilled water in a bottle bath for 10minutes. The mixture was filtered while hot and allowed to cool. The following tests were then carried out. Demonstration of frothing: 2.5 ml of filtrate was diluted to 10ml with distilled water and shaken vigorously for 2minutes (frothing indicated the presence of spooning in the filtrate). Demonstration of emulsifying properties: 2 drops of olive oil was added to the solution obtained from diluting 2.5 ml filtrate to 10 ml with distilled water (above), shaken vigorously for a few minutes each specimen. The resulting mixture was shaken	Saponins decrease blood lipids, lower cancer risks, and lower blood glucose response. the inhibition of dental caries and platelet aggregation, in the treatment of hypercalciuria in humans, and as an antidote against acute lead poisoning. Saponin can reduce the increment of blood glucose by inhibiting the enzymes that break down

for 5 minutes after which it was filtered. The filtrate was then shaken with equal volume of 10 % ammonia solution. The presence of a bright pink color in the aqueous layer indicated the presence of free anthraquinones.

disaccharides into monosaccharides

MATERIALS AND METHOD:

Materials:

Tridax procumbeans plant were obtained from Nashik region Maharashtra India. The plant are then shade dried then makes a whole plant of *Tridax procumbens* extract use for formulation 1, 2.

First extraction preparation:

The dried whole plant of *Tridax procumbens* was extracted with Ethanol (90%) was used to obtain the whole plant extraction through cold Maceration for 72 hours. This Extract to mix in the water and the different additives such as Tween -80, sodium carboxymethyl cellulose (CMC), sodium benzoate, flavoring agents, sweetening agent used for its better stability during shelf life of suspension formulation ³



Figure 1: Extraction preparation

Preparation of herbal suspension:

The composition of formulation for preparing 100 ml of suspension of *tridax procumbeans* Extraction of the drugs that are properly mixed by trituration. After that the drug mix in water and the different additive such as Tween-80, sodium carboxy methyl cellulose (CMC), sodium benzoate, sweetening agent, flavoring agent, used for its better stability during shelf life of formulation.

Accelerated stability studies:

The accelerated stability studies have been carried out for herbal suspension. The different parameters such as sedimentation volume, viscosity, pH, and crystal growth were studied for the formulation and results for particular test can be noted.

Stability Parameter for Suspension ²:

Physical Test of herbal suspension:

The physical test of Polyherbal formulation was carried out at room temperature 30°C.

Viscosity

The viscosity of the sample was determined at room temperature using OSWALD's viscometer.

pH

The pH of suspension was determined using pH meter and noted.

Sedimentation volume

The time required for suspension sample to flow through a pipette was determined the apparent viscosity of suspension and can be calculated using the following equation Flow rate = Volume of pipette (ml)/Flow time.

Crystal growth Stability

Crystal growth Stability of First formulation suspension will also reduce because of crystal growth; Suspension had been stored in room temperature. After that it has been set under visual examination for 16 days after 16 days it doesn't show Present of magnification of Crystal growth.

Crystal growth Stability of second formulation suspension will also present because of crystal growth, Suspension had been stored in room temperature. After that it has been set under visual examination for 16 days after 16 days it has shown Present of magnification of Crystal growth.



Figure 2: *Tridax procumbens*

Table 2: Composition of Herbal extract Suspension

Name of Ingredients	Quantity		
	F1	F2	F3
<i>Tridax procumbens</i> Extraction	1ml/g	10ml/g	100ml/g
Tween 80	0.1w/v	0.1w/v	0.1w/v
Sodium CMC	1%	1%	1%
Sodium benzoate	1g	1g	1g
Sugar™ Free gold	0.1	0.1	0.1
Lemon oil	5 drop	5 drop	5 drop
Purified water q.s	100ml	100ml	100ml

Physical test for herbal suspension

Table 3: Physical test did for *tridax procumbens* extract suspension

Parameter	F1	F2	F3
Nature	Liquid	liquid	liquid
Color	Yellow green	Yellow green	Yellow green
Odor	Aromatic	Aromatic	Aromatic
Texture	Suspension	Suspension	Suspension

Table 4: Accelerated stability studies of tridax procumbens extract suspension

Parameter	F1	F2	F3
pH	6.09	6.19	7.6
Viscosity (cps)	68.5cP	57.06	61.9
Crystal growth	NO	No	NO
Sedimentation rate	1 .00	2.59	1.27

RESULTS AND DISCUSSION:

The prepared suspension formulation was found to have redispersibilities property with sedimentation studies showed that the sedimentation volume of extract formulation F3, which indicates that the formulation was optimum and acceptable (Table no 04). All stability parameter is best, stable and suitable at variable temperature. There was no significant change observed in physicochemical and organoleptic behavior of the suspension.

CONCLUSION:

The present study “Formulation and Evaluation of Herbal Anti diabetic suspension” revealed certain conclusion. The Anti-diabetic herbal suspension prepared in the laboratory scale may be used as a liquid dosage form which is stable and the results of the AST may improve in shelf-life degradation studies of herbal suspension helping ‘Herbal pharmaceuticals’ in future. Finally, we conclude that, the evaluation undertaken of developed herbal cough syrup reveal compliance with all the physicochemical and analytical procedures, therefore it is concluded that *tridax procumbeans* herbal suspension is well standardized product at the base line parameters.

REFERENCES:

1. Debolina Dattaray, Traditional Uses and Pharmacology of Plant *Tridax procumbens*: A Review, Systematic Review Pharmacy, 2022; 13(7): 476-482.
2. Manisha Modak, Priyanjali Dixit, Jayant Londhe, Saroj Ghaskadbi, and Thomas Paul A. Devasagayam, Indian Herbs and Herbal Drugs Used for the Treatment of Diabetes, Journal of clinical Biochemistry and Nutrition 40(03); 2007: 163-167.
3. Kokate CK, Gokhale SB, Purohit AP., A textbook of Pharmacognosy, Nirali Prakashan, 55th Edition 2008, P. 147.
4. J E Shaw , P Z Zimmet, D McCarty, M de Courten, Type 2 diabetes worldwide according to the new classification and criteria, Diabetes care, PubMed, 2000; 23(2), 5-10.
5. Srivastava S., *et al.*, Formulation and Stability Studies of Herbal Suspension of Agarics *Bisporus* powder, Innovare Journal of Health Sciences, 2017; 5(3): 1-7.

6. Srivastava, Shubha & Panda, Prabhudutta & Verma, Navneet & Vishwakarma, Dhaneshwar, Formulation and Stability Studies of Herbal Suspension of Agarics Bisporus Powder, 2017; 05(03): 1-5.
7. Pareek H, Sharma S, Khajja BS, Jain K, Jain GC. Evaluation of hypoglycemic and anti-hyperglycemic potential of *Tridax procumbens* (Linn.). BMC Complement Altern Med. 2009 Nov 29;9:48. doi: 10.1186/1472-6882-9-48. PMID: 19943967; PMCID: PMC2790435.
8. Chen W, Han Y, Wang Y, Chen X, Qiu X, Li W, Yao Y, Zhu T. Associations between changes in adipokines and exposure to fine and ultrafine particulate matter in ambient air in Beijing residents with and without pre-diabetes. BMJ Open Diabetes Res Care. 2020 Dec;8(2):e001215. doi: 10.1136/bmjdr-2020-001215. PMID: 33361362; PMCID: PMC7768822.
9. Sujit S. Kale and Amol S. Deshmukh, *Tridax Procumbens*: A Medicinal Gift of Nature, Asian Journal of Research in Biological and Pharmaceutical Sciences, 2014; 02(04): 159-162.
10. Anil Saini & Dr. Parvesh Gupta, Phytochemical Studies of The Leaves of *Tridax Procumbens*, IJRAR, 2018; 05(03): 503-507.
11. Ajayi I. A., Ajibade O. and Oderinde R. A., Preliminary Phytochemical Analysis of some Plant Seeds, Research Journal of Chemical Sciences, 2011; 01(03): 58-62.

AJPTR is

- Peer-reviewed
- bimonthly
- Rapid publication

Submit your manuscript at: editor@ajptr.com

